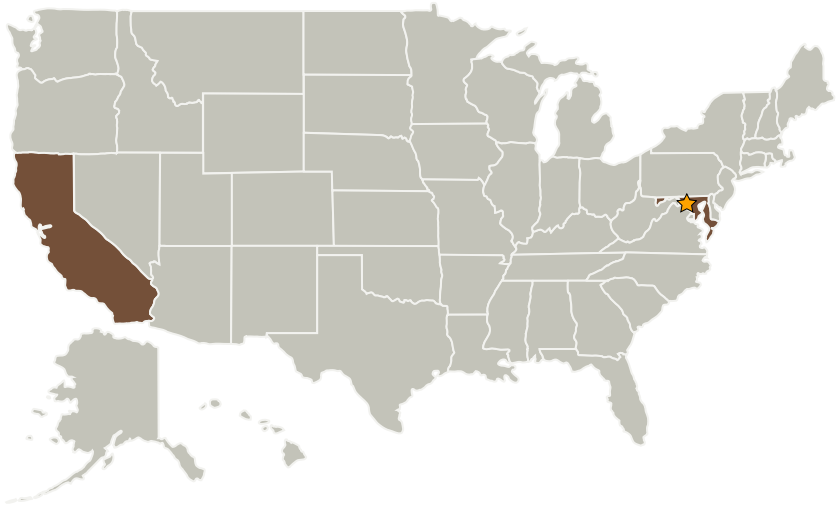
Radiation Hard Space Wire Gigabit Ethernet Compatible Transponder, Phase II

Completed Technology Project (2007 - 2009)

Project Introduction

High-bandwidth, Radiation Hardening, low-power, low-EMI, easily reconfigurable and upgradeable transponder-based interconnects between processor nodes, subsystems, and blocks are of utmost importance for the achievement of high performance computing on orbit and for providing reliable electronic systems in natural space and terrestrial radiation environments. In response to the described needs, we will develop a novel, monolithic radiation-tolerant transponder, which will be integrated into a hermetically-sealed pigtailed multi-chip module, containing opto-electrical and electro-optical components. Module will be featuring FPGA-friendly parallel interface and will provide an improved radiation tolerance, high data rate, low power consumption, and advanced functionality. The developed ASIC transponder will utilize our patent-pending high-speed current-mode logic library of TID-tolerant-by-technology and SEU/SEE-tolerant-by-architecture cells. 8B10B encoding will be used to achieve data disparity equal to 0, optimize performance of the optical receiver, and perform a reliable clock recovery. The encoder and decoder will utilize our patented radiation tolerant half-rate architecture. A fully functional module will be delivered and tested at the end of Phase II.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Advanced Science and Novel Technology	Supporting Organization	Industry	Rancho Palos Verdes, California

Primary U.S. Work Locations	
California	Maryland

Project Transitions

December 2007: Project Start

December 2009: Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX02 Flight Computing and Avionics
  - TX02.2 Avionics Systems and Subsystems
    - TX02.2.5 High Speed Onboard Interconnects and Networks